

Plaintiffs' Exhibit 27 (Redacted)

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA**

Alexandria Division

UNITED STATES, et al.,)	
)	
Plaintiffs,)	
v.)	No. 1:23-cv-00108-LMB-JFA
)	
GOOGLE LLC,)	
)	
Defendant.)	

**DECLARATION OF ROSA M. ABRANTES-METZ
IN SUPPORT OF PLAINTIFFS' OPPOSITION TO
GOOGLE'S MOTION FOR SUMMARY JUDGMENT**

Rosa Abrantes-Metz, PhD., being duly cautioned, declares as follows:

1. I am over 21 years old and am competent to testify about the matters in this Declaration based on my personal knowledge.
2. Attached hereto as Exhibit A is a true and correct copy of the December 22, 2023, Expert Report of Rosa M. Abrantes-Metz, PhD. Attached hereto as Exhibit B is a true and correct copy of the February 13, 2024, Expert Rebuttal Report of Rosa M. Abrantes-Metz, PhD.
3. I authored the attached Expert Reports identified in Item (2) above and understood at the time I signed them that they were being prepared for use in this litigation. I am prepared to testify at trial, under oath, to the matters set forth in these reports. My statements set forth in these reports are true and correct to the best of my knowledge.
4. The exhibits attached to the reports described in Item (2) are true and correct copies.

I declare under penalty of perjury that the foregoing statements in this Declaration are true and correct.

Dated: _____
Signed: Rosa M. Abrantes-Metz

Rosa M. Abrantes-Metz, PhD.

County and State: Orange County, NY

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION**

United States of America, *et al.*,

Plaintiffs,

v.

Google LLC,

Defendant.

Case No. 1:23-cv-00108-LMB-JFA
Hon. Leonie H. M. Brinkema

EXPERT REPORT OF ROSA M. ABRANTES-METZ, PH.D.

December 22, 2023

party data.¹¹⁸

ii. Publisher Products

1. AdSense

82. Google offers an advertiser ad network, Google Ads, discussed above, and a publisher ad network, AdSense.¹¹⁹ AdSense is described by Google as a “turnkey” product for “less sophisticated publishers.”¹²⁰ AdSense allows publishers to place a line of code on their webpage, leading to ads being placed without the use of a publisher ad server.¹²¹ AdSense does not manage direct transactions with advertisers and does not access the demand of third-party ad networks or exchanges.¹²² AdSense “provides a way for website publishers of all sizes to earn money by displaying targeted Google ads on their websites.”¹²³ The AdSense network includes “more than 2 million publishers,”¹²⁴ and offers its publishers’ inventory for sale to Google Ads advertisers and on the AdX

¹¹⁸ GOOG-AT-MDL-004236722, at -735 (2016); and DAN000021, at -023 (Undated).

¹¹⁹ GOOG-DOJ-14174064, at -081 (Undated).

¹²⁰ Deposition of Tim Craycroft (Google), August 15, 2023, 162:24–163:4.

¹²¹ “How AdSense Works,” Google AdSense Help, available at https://support.google.com/adsense/answer/6242051?hl=en&ref_topic=1319753&sjid=9456192387848298416-NA, last accessed December 4, 2023. AdSense can be called as an inventory source within a publisher ad server, but the use of a publisher ad server is not required to access AdSense. GOOG-DOJ-04004392, at -397 (Undated).

¹²² “Compare Ad Manager, AdSense and AdMob,” Google AdSense Help, available at https://support.google.com/adsense/answer/9234653?hl=en&ref_topic=1319753&sjid=9456192387848298416-NA, last accessed December 4, 2023; and GOOG-DOJ-13218256, at -256 (October 11, 2018).

¹²³ “AdSense,” Google Ads Help, available at <https://support.google.com/google-ads/answer/6519?hl=en&sjid=122803373026192189-NA>, last accessed December 4, 2023.

¹²⁴ Cetinkaya, Ezgi, “Welcome to Google AdSense,” Google AdSense, March 4, 2020, available at <https://blog.google/products/adsense/welcome-google-adsense/>, last accessed December 4, 2023.

advertising exchange.¹²⁵ Together Google Ads and AdSense were known as the Google Display Network (GDN).¹²⁶

2. DoubleClick for Publishers

83. Google offers a separate product, DoubleClick for Publishers (“DFP”), for publishers that need features like managing direct sales, or that want access to third-party ad networks and exchanges.¹²⁷

84. In March 2008 Google completed its acquisition of DoubleClick.¹²⁸ At the time of the acquisition, DoubleClick offered several sell-side products including a publisher ad server.¹²⁹ DoubleClick represented that around the time of the acquisition they worked with “35 of Top 50 web publishers,” and Google estimated that DoubleClick had a “60% share of publisher ad serving market.”¹³⁰

¹²⁵ GOOG-DOJ-04601261, at -261 (March 13, 2018); and “Compare Ad Manager and AdSense,” Google Ad Manager Help, available at https://support.google.com/admanager/answer/4599464?hl=en&ref_topic=7520097, last accessed December 4, 2023. Most AdSense inventory is sold to Google Ads advertisers. For example, a 2018 Google strategy document indicates that 84 percent of AdSense inventory was sold via Google Ads. The remaining 16 percent of AdSense inventory was sold via AdX and is a small portion of AdX’s total transaction volume. The same 2018 Google strategy document indicates that AdSense transacts 12.8B impressions per day, while the combination of AdX-direct and GAM transact 50.06B impressions per day. That implies that 2.048B AdSense impressions are transacted on AdX per day, or only about 4 percent of AdX’s daily transaction volume. (GOOG-DOJ-04004392, at -393 and -394).

¹²⁶ GOOG-DOJ-14174064, at -081 (Undated).

¹²⁷ “Compare Ad Manager, AdSense and AdMob,” Google AdSense Help, available at https://support.google.com/adsense/answer/9234653?hl=en&ref_topic=1319753&sjid=9456192387848298416-NA, last accessed December 4, 2023.

¹²⁸ “Google Closes Acquisition of DoubleClick,” Google, March 11, 2008, available at https://googlepress.blogspot.com/2008/03/google-closes-acquisition-of_11.html, last accessed December 4, 2023.

¹²⁹ GOOG-DOJ-01657697, at -712 and -713 (March 15, 2007).

¹³⁰ GOOG-DOJ-01657697, at -701 and -845 (March 15, 2007).

85. After the acquisition, DoubleClick for Publishers became Google's publisher ad server.¹³¹ DFP "offers a complete toolkit" for publishers "to manage ads."¹³² Google describes the "primary functions" of DFP as "ad delivery, reporting and forecasting."¹³³ DFP helps publishers manage direct, RTB and network transactions, and it leverages "advanced forecasting" to help publishers know how many impressions they can sell directly.¹³⁴ Google documents indicate that DFP "is the market leader in digital advertising" and "has been the ad server of choice for pretty much all publishers for display" with "90% market share."¹³⁵

iii. Exchange Products

1. AdX

86. Google's acquisition of DoubleClick in 2008 also included DoubleClick's ad exchange.¹³⁶ After the acquisition, DoubleClick Ad Exchange, also known as AdX,¹³⁷

¹³¹ Mohan, Neal, "The Next Generation of Ad Serving for Online Publishers," Google, February 22, 2010, available at <https://googleblog.blogspot.com/2010/02/next-generation-of-ad-serving-for.html>, last accessed December 4, 2023.

¹³² GOOG-AT-MDL-004164142, at -147 (Undated).

¹³³ GOOG-AT-MDL-004164142, at -147 (Undated).

¹³⁴ GOOG-AT-MDL-004164142, at -147 (Undated).

¹³⁵ GOOG-DOJ-03070314, at -314 (Undated).

¹³⁶ Google Closes Acquisition of DoubleClick," Google, March 11, 2008, available at https://googlepress.blogspot.com/2008/03/google-closes-acquisition-of_11.html, last accessed December 5, 2023; and Story, Louise, and Miguel Helft, "Google Buys DoubleClick for \$3.1 Billion," The New York Times, April 14, 2007, available at <https://www.nytimes.com/2007/04/14/technology/14DoubleClick.html>, last accessed December 4, 2023.

¹³⁷ In July 2018, Google unified DFP and AdX under the name Google Ad Manager. (Ramaswamy, Sridhar, "Introducing Simpler Brands and Solutions for Advertisers and Publishers," Google, June 27, 2018, available at <https://blog.google/technology/ads/new-advertising-brands/>, last accessed December 4, 2023.)

A. Google Leveraged Its Dominance to Build an Open Web Display Ads Empire

i. Google Acquired the Tools to Transact Open Web Display Advertising

247. Since its founding in 1998, Google has become a dominant force in information technology markets, catapulted by its search engine business that monetized search results by selling advertisements on the webpages that displayed them. Google has since worked to extend that success and dominance to open web display advertising, and in so doing has excluded rivals throughout the ad tech stack, obstructing their efforts to compete for customers.

248. Google's dominance in internet advertising is a result, in part, of AdWords (later renamed Google Ads), which it launched in 2000. AdWords allowed advertisers to place ads on Google's search results pages according to advertiser bids across collections of search terms.³⁶¹

249. The success of its search advertising business led Google to expand its coverage to include third-party websites.³⁶² Google then acquired assets to "play across the entire marketer-to-publisher chain," i.e., across the entire open web display ad tech stack.³⁶³

³⁶¹ "Google turns 20: how an internet search engine reshaped the world," The Verge, September 27, 2018, available at <https://www.theverge.com/2018/9/5/17823490/google-20th-birthday-anniversary-history-milestones>, last accessed December 7, 2023.

³⁶² GOOG-DOJ-AT-01592535, at -542, (Undated, Google slide deck titled "Welcome to the Sell-Side world!").

³⁶³ GOOG-DOJ-AT-01592535, at -544, (Undated, Google slide deck titled "Welcome to the Sell-Side World").

250. The predicate for Google’s challenged conduct was its acquisition of DoubleClick in 2008, which I describe in Sections II.G.i.2 and II.G.ii.2. This acquisition equipped Google with a publisher ad server and an ad exchange. Combined with Google’s valuable advertiser ad network, these assets enabled Google to begin cementing its market dominance across the ad tech stack.³⁶⁴ As described subsequently in this section, Google leveraged its DoubleClick acquisition to extend its market power to the Ad Exchange market and defend its market power in the Publisher Ad Server and Advertiser Ad Network markets.

251. From the time of its DoubleClick acquisition, Google had the ability to use its acquired dominance in the Publisher Ad Server market to control decisions that allocate publisher impressions to ad buyers, i.e., the “decision engine.” Google referred to this strategy as “owning the tag,” which referenced a snippet of html code on webpages that solicited a publisher ad server to allocate impressions.³⁶⁵ “Owning the tag” meant that DFP would receive the solicitation to allocate an impression on a webpage and, thereby, control the ultimate allocation decision.

252. Google perceived “numerous benefits” from being the first tag on the webpage that controlled the ad serving decision.³⁶⁶ Importantly, it enabled Google to “[g]ain

³⁶⁴ “Google turns 20: how an internet search engine reshaped the world,” The Verge, September 27, 2018, available at <https://www.theverge.com/2018/9/5/17823490/google-20th-birthday-anniversary-history-milestones>, last accessed December 7, 2023.

³⁶⁵ GOOG-DOJ-04429792, at -794 (April 2017, Google slide deck: “Historically, Google has deployed an ‘own the tag’ strategy based on DFP to be the decision engine to allocate the impressions.”).

³⁶⁶ GOOG-DOJ-13503400, at -404 and -405 (February 7, 2019, Google document titled, “Strategy Paper: Client-Side Demand”).

3. Through Project Poirot, Google Directed Transactions to AdX by Lowering Bids to Third-party Exchanges

280. From the launch of real-time bidding and ad exchanges, remnant advertising impressions were predominantly transacted via second-price auctions. Over time, some exchanges began to operate first-price auctions—or hybrids between first- and second-price auctions.⁴¹³
281. As I explain in Section VI.C, different auction types present different bidding incentives to buyers. It is not optimal for advertisers to bid their willingness to pay in first-price auctions, or those that resemble first-price auctions, because advertisers will not extract any surplus from the auction. Consequently, it can be efficient for buyers to “shade” their bids below their willingness to pay when bidding into first-price auctions. Project Poirot is a DV360 program that shades bids into some ad exchanges.
282. Beginning in 2017, Google observed that header bidding frequently meant that DV360 would receive multiple ad requests to bid on the same impressions from different exchanges.⁴¹⁴ DV360 launched a program called “Poirot” to shade its advertisers’ bids depending on certain conditions. Bids were shaded differentially across exchanges ostensibly to optimize advertiser surplus. Google determined the bid shading parameter for each exchange and advertiser pair on the basis of small, frequent experiments as

⁴¹³ See GOOG-AT-MDL-001283581, at -581, -586, -589, and -596 (May 30, 2017, Google document titled “Exchange Auction Format Analysis”) (“[S]ome exchanges appear to simply run first-price ... auctions” ... “AppNexus appears to aggressively use first pricing” ... “OpenX seems to use multiple levels of price floors. The results are somewhat skewed towards first-price, but no soft floors or consistent first-pricing are visible.”).

⁴¹⁴ GOOG-DOJ-10308470, at -470 – 471 (January 15, 2020, Google document titled, “DV360 Supply Path Strategy POV”).

described by Professor Ravi.⁴¹⁵ Where Google estimated less than a 10% gain in advertiser surplus from bid shading for an advertiser-exchange pair, DV360 did not shade bids. Initially, Google reduced DV360 advertiser bids by as much as 40%.⁴¹⁶ Later, it shaded bids by as much as 90%.⁴¹⁷

283. When Poirot initially launched in July 2017, the program was not applied to Google's exchange, AdX.⁴¹⁸ Instead, it was applied to "all third-party ad exchanges on which DV360 bids."⁴¹⁹ AdX was later subject to Poirot, though Google's standard requiring at least 10% improvement to advertiser surplus resulted in DV360 bids being passed onto AdX without any bid shading. Hence, Poirot lowered the bids DV360 submitted to

⁴¹⁵ Ravi Report Appendix F.

⁴¹⁶ GOOG-DOJ-AT-02480369, at -371 (July 2018, Google document titled "Poirot model update with first price signal and aggressive bid lowering").

⁴¹⁷ GOOG-DOJ-12059682, at -682 (August 2018, Google document titled "Poirot v2.0") ("Lower the floor on bid shaving from 0.6 to 0.1."); *See also* GOOG-DOJ-AT-02635025, at -027 (July 31, 2018, Google document titled "Poirot model update with first price signal and aggressive bid lowering").

⁴¹⁸ Ravi Report, Appendix F. *See also* GOOG-AT-MDL-008842383, at -391 (August 5, 2023, Declaration of Nirmal Jayaram) ("Since September 2017, Poirot has applied on AdX and on all third-party ad exchanges on which DV360 bids" and "Poirot did not apply to AdX until September 2017."); *See also* GOOG-AT-MDL-015502339, at -339 (Google email chain starting on September 6, 2017 regarding an overdue update to Poirot, "This also fixes a bug in the serving code although currently Adx gets an adjustment of 1.0 anyway so the bug is not active."); and *See also* GOOG-AT-MDL-007393541, at -549 (June 16, 2023, Google presentation titled, "Poirot Launch Metrics," "Chart does not include AdX, which is 47% of DBM, multiplier of 1 - other clean exchanges include United, Adaptv, Improve Digital...").

⁴¹⁹ Ravi Appendix F. *See also* GOOG-AT-MDL-008842383, at -391 (August 5, 2023, Declaration of Nirmal Jayaram) ("Since September 2017, Poirot has applied on AdX and on all third-party ad exchanges on which DV360 bids" and "Poirot did not apply to AdX until September 2017."); *See also* GOOG-AT-MDL-015502339, at -339 (Google email chain starting on September 6, 2017 regarding an overdue update to Poirot, "This also fixes a bug in the serving code although currently Adx gets an adjustment of 1.0 anyway so the bug is not active."); and *See also* GOOG-AT-MDL-007393541, at -549 (June 16, 2023, Google slide deck titled, "Poirot Launch Metrics," "Chart does not include AdX, which is 47% of DBM, multiplier of 1 - other clean exchanges include United, Adaptv, Improve Digital...").

AdX's rivals, but not to AdX.⁴²⁰

284. DV360 did not shade bids to AdX despite the fact that Google acknowledged AdX was not a clean second-price auction.⁴²¹ Bryan Rowley, Google's head of global strategy and commercialization for Ad Manager & Authorized Buyers, admitted that "buyers like Criteo are already shaving their bid on our auction because on (sic) sell-side optimizations like Optimized Pricing. We have not been a true 2nd price auction for some time now."⁴²²

285. AdX engaged in Reserve Price Optimization ("RPO") to help publishers extract surplus from advertisers via optimized reserve prices. Google recognized that RPO created conditions under which some versions of Poirot would be triggered on AdX. A 2018 Google memo describing a new version of Poirot reports that the "AdX team is building RPO for AdX for bids higher than \$5. The production [P]oirot model doesn't react to this but the launch candidate does."⁴²³ Meeting notes related to an "online RPO

⁴²⁰ Google had a threshold of finding at least a 10% improvement in advertiser surplus in order to implement Poirot's bid shading. It appears that bid shading on AdX did not meet that standard despite evidence that AdX engaged in conduct that would deviate from a true second-price auction. The evidence I have reviewed does not elaborate on Google's reasoning for choosing the 10% improvement standard. It is possible that a condition for this standard was to exempt AdX from Poirot's bid shading.

⁴²¹ Ravi Report, at Section III.D.4. ("Google's exchange AdX, however, ..., did not implement clean second-price auctions ..., yet Google avoided triggering DV360's bid shading program."). *See also* GOOG-DOJ-AT-00810221, at -221 (January 10, 2019, Google email chain and chat regarding "Summary for Scott – I think my overwhelming concerns here...") ("I do know buyers like Criteo are already shaving their bid on our auction because on sell-side optimizations like Optimized Pricing. We have not been a true 2nd price auction for some time now.").

⁴²² GOOG-DOJ-AT-00810221, at -221 (January 10, 2019, Google email chain and chat regarding "Summary for Scott – I think my overwhelming concerns here...") ("I do know buyers like Criteo are already shaving their bid on our auction because on sell-side optimizations like Optimized Pricing. We have not been a true 2nd price auction for some time now.").

⁴²³ GOOG-AT-MDL-007393625, at -630 (January 2018, Google memo titled "Summary of Poirot with Bid Buckets").

launch” indicate that “two models” have been “proposed from DRX, both within bounds of what Poirot detects.”⁴²⁴ Notes from the same meeting state that “If AdX is going further down RPO, DBM will refine Poirot.”⁴²⁵ Google also studied the “interaction between Poirot & AdX RPO” to determine if “bid bucket based Poirot react[s] to RPO on AdX.”⁴²⁶

286. In addition, Google acknowledged that RPO moved AdX away from a true second-price auction. In a 2015 email chain a Google employee stated that RPO “undermine[s] the whole idea of second price auctions” because “if the publisher manufactures a floor price based on your bid to get you to pay more than the second price” then “It’ll transform the system into a 1st price auction where the bidder has a strong incentive to bid LESS than he’s willing to pay”⁴²⁷ Internal meeting notes from Google state that RPO is “basically pushing our second price auction – that is supposed to be fair – toward a first priced auction.”⁴²⁸

287. Poirot benefited AdX by likely lowering the floor price publishers set for AdX. By

⁴²⁴ GOOG-DOJ-15482980, at -010 (March 13, 2016, Google meeting notes in section titled “Online RPO Launch Decision”).

⁴²⁵ GOOG-DOJ-15482980, at -010 (March 13, 2016, Google meeting notes in section titled “Online RPO Launch Decision”).

⁴²⁶ GOOG-AT-MDL-008771396, at -396 (November 7, 2017, Google memo titled “Interaction between Poirot & AdX RPO”).

⁴²⁷ GOOG-DOJ-03880564, at -564 (April 30, 2015, Google internal email chain, starting on April 30, 2015: “Doesn’t that undermine the whole idea of second price auctions? I.e. the assurance that you can bid the maximum you’re willing to pay with no negative consequences. But if the publisher manufactures a floor price based on your bid to get you to pay more than the second price, this principle gets violated. It’ll transform the system into a 1st price auction where the bidder has a strong incentive to bid LESS than he’s willing to pay. (Only just enough to win.) I don’t think that’s desirable for either side in the long term.”) (emphasis in original).

⁴²⁸ GOOG-DOJ-10572595, at -603 (August 19, 2015, Google document containing notes on various topics related to Google’s Ad Tech products).

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lowering bids to rival exchanges, Poirot likely softened header bidding competition and lowered the header bidding floor price DFP passed to AdX.⁴²⁹ At the same time, lower DV360 bids to rival exchanges lowered their historical average bids, provided DV360's unshaded bids cleared auctions prior to Poirot. This, in turn, lowered floor prices passed to AdX from the Dynamic Allocation waterfall. In both cases, AdX could more easily win the auction when presented with a reduced floor price.

288. Poirot also advantaged AdX by preserving DV360 advertiser budget for expenditures on AdX. DV360 advertiser expenditures on rival exchanges declined for two reasons: (i) advertisers are less likely to win impressions on rival exchanges when their bids are shaded; and (ii) when DV360 advertisers win on rival exchanges, they do so at lower prices.

289. Poirot shifted spending toward AdX, as recognized by Nirmal Jayaram, Senior Director of Engineering at Google, who stated that "Poirot currently generates margins by shifting inventory to Adx."⁴³⁰ Google characterized Poirot as a "quite effective" response to header bidding.⁴³¹ It increased AdX revenues by 7% and reduced revenues of rival exchanges.⁴³² DV360 advertiser spending shifted toward AdX and away from

⁴²⁹ Ravi Report, Section III.D.3.

⁴³⁰ GOOG-AT-MDL-008515131, at -133 (February 28, 2019, Google email chain from February 28, 2019 with subject "Fwd: TTD and Poirot").

⁴³¹ GOOG-TEX-00085512, at -512 (March 16, 2018, Google email chain from March 16, 2018 regarding "Header Bidding Observatory/Edition #3") ("Our response to HB has been a multi-pronged effort, which includes a few projects...3. First-Price Auction Defenses in DBM...3. Poirot has actually been quite effective").

⁴³² GOOG-TEX-00085512, at -512 (March 16, 2018, Google email chain from March 16, 2018 regarding "Header Bidding Observatory/Edition #3") ("3. Poirot has actually been quite effective, resulting in DBM spending 7% more on AdX and reducing spend on most other exchanges.") (emphasis removed).

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rival exchanges once Poirot was launched.⁴³³ In fact, DV360 spending on third-party exchanges declined by 30%; after Poirot, “over 70% of DBM spend happens on Adx.”⁴³⁴

290. By shifting spend to AdX, Poirot reduced spending on third-party exchanges. An internal memo from Google reported that Poirot resulted in “[t]he spend on 3PEs [third-party ad exchanges] dropp[ing] by a whopping 32%.”⁴³⁵ In a September 2019 email, Google’s Ali Nasiri Amini wrote “Poirot reduced spend on most of 3P by 15%.”⁴³⁶

291. There is also evidence that Poirot helped Google maintain its 20% revenue share on AdX. A 2019 email discussing AdX’s current revenue share states “[W]e should continue to hold the line” on AdX’s open auction revenue share “esp. given current health growth levels, since project Poirot.”⁴³⁷

⁴³³ GOOG-DOJ-07285943, at -950 and -954 (December 7, 2018, Google slide deck titled, “Display RevForce,” “DBM...2. Growth recovery strongest on Network inventory, as Poirot launches drive spend to AdX from 3PE (now flat Y/Y).”, “3PE: DBM on 3PE, AwBid[:] 3PE at 81% of Plan as growth falls negative in Q4 as Poirot exaggerates decline from GDPR...1. Perf on NonGoogle (3PE) declining to 81% of Plan vs 86% in Q3, as Poirot launches reduce bids on 1P 3PE auctions...Awbid is at 54% [spend compared] to Plan...Of the 46ppt miss vs Plan...13ppt from Poirot[.] DBM [at] 90% [spend compared] to Plan vs 96% in Q3, falling in Q4 with Poirot’s complete rollout. Of the 18ppt decline vs pre-GDPR: 10-14ppt estimated from Poirot”) (emphasis removed).

⁴³⁴ GOOG-DOJ-AT-00060011, at -011 (January 4, 2019, Google slide deck regarding “AdX 1p auction migration”) (“3PE exchange fraction has dropped significantly (~ 30% for DBM by spend)...over 70% of DBM spend happens on Adx”).

⁴³⁵ GOOG-DOJ-AT-00573309, at -310 (September 24, 2019, Google Memo discussing Project Poirot).

⁴³⁶ GOOG-AT-MDL-001427607, at -607 (September 5, 2019, Google email chain starting on September 5, 2019 with subject “Re: DVA & Cramalgam”).

⁴³⁷ GOOG-DOJ-AT-00008410, at -411 (February 13, 2019, Google email chain starting on February 12, 2019 with subject “Re: GPX Deals Summary”).

source in the publisher's waterfall which, in this example, would be Exchange A. It is important to understand that this is no longer an average or random impression being presented to Exchange A, but instead is an impression of below-average value by virtue of having been passed over by AdX. While Exchange A might be able to transact the impression, it can be expected to do so at a price less than \$1. Over time, the average price provided by Exchange A will drop to, say, \$0.90.

329. Now, when a new impression is created, the publisher will pass this lower floor price of \$0.90 to AdX. AdX becomes more likely to win the impression with a lower floor price. Only impressions with a value less than \$0.90 will be passed to Exchange A. And so, Exchange A's bid can be expected to be below \$0.90. Hence, Exchange A's historical average price falls again. As this process continues, AdX will capture ever more transactions, and Exchange A will capture ever fewer.

3. Google's Exclusive First Look Advantage for AdX Harmed Its Publisher Customers

330. As Google explains, DA and EDA awarded AdX impressions even if other demand sources could have beaten the AdX bid, costing Google's own publishers revenue.

Quoting from a Google email:

The 'unfair advantage' comes from historically third-party exchanges cannot compete with AdX through EDA on the similar footing. Pre-Jedi [Open Bidding] we allow DFP publishers to put in only the 'average payout' on the DFP line item that represents the opportunity cost of the third-party exchange. Publishers lose every time the third-party exchange has higher payout than the average (say, remarketing bids). For example,

DFP publishers get on average \$1 from Pubmatic. With EDA on we set the reserve price at \$1, and any AdX buyer including GDN can win over the query as long as they bid more than \$1. This transaction happens before we actually call Pubmatic and get their actual bids. If Pubmatic is willing to pay \$3 on the query, publishers leave \$2 on the table.⁵⁰⁰

331. Another Google email notes, “[w]e managed historically to have an advantage through EDA vs other sources of demand ... so our demand could win even if we did not provide the best CPM on a specific impression.”⁵⁰¹

332. Publishers felt “locked in by dynamic allocation in DFP, which only gave AdX ability to compete.”⁵⁰² Google acknowledged that publishers thought “that having DA use AdX’s real time price to compete with 3rd party average prices [in the waterfall] is costing publishers lost revenue & that AdX is cherry picking the good impressions, further reducing 3rd party yield.”⁵⁰³ In fact, header bidding was an innovation designed to circumvent the link between DFP and AdX.⁵⁰⁴ It was used to “dodge EDA.”⁵⁰⁵

⁵⁰⁰ GOOG-DOJ-14156104, at -105 (Google email chain starting on September 15, 2016 from Max Lin regarding how valuable EDA is to Google.)

⁵⁰¹ GOOG-TEX-00104315, at -415 (Google email chain starting on September 2, 2016 regarding Header Bidding from Jerome Grateau September 15, 2016) (ellipsis in original).

⁵⁰² GOOG-DOJ-05276794, at -794 (Google email chain starting on March 16, 2018 regarding the Header Bidding Observatory Team and the 3rd edition of their Header Bidding slide deck.).

⁵⁰³ GOOG-DOJ-13202550, at -585 (Undated, Google slide deck titled, “Mediation Update”).

⁵⁰⁴ GOOG-DOJ-05276794, at -794 (Google email starting on March 16, 2018 regarding the Header Bidding Observatory Team and the 3rd edition of their Header Bidding slide deck.).

⁵⁰⁵ GOOG-DOJ-11763947, at -949 (Google email starting on July 21, 2015 regarding Technorati’s release of a “Teck to Manage Multiple Header Bidding Partners”).

4. Google's Exclusive First Look Advantage for AdX Benefited AdX and Excluded Rival Ad Exchanges

333. Essential to the competitiveness of ad exchanges is access to buyers and sellers. The value of an ad exchange to buyers increases in the amount of impression inventory available on the exchange. Due to indirect network effects, more inventory begets more buyers, which, in turn, increases the value of an exchange to sellers. In short, an exchange transacts more impressions when it has access to more inventory.
334. Consequently, DA was “a key strategic pillar” for Google that was “key to establishing ourselves as a preferred holistic yield management partner to a great many pubs across the globe.”⁵⁰⁶ As one Google employee observed, DA is a “[m]assive thing that generates a ton of money for us.”⁵⁰⁷
335. DA directed DFP inventory to AdX and left other exchanges to compete for impressions AdX passed over. Google understood that Dynamic Allocation within DFP effectively routed impressions to AdX independently of the merits of AdX or the strength of its buyers. In fact, Google knew that if it “secured” DFP adoption, then “we have a +20% monetization advantage due to dynamic allocation,” referring to the 20% take rate Google enjoyed on AdX:⁵⁰⁸

⁵⁰⁶ GOOG-DOJ-04387378, at -401 (2018, Google slide deck titled, “Header Bidding Observatory #3”).

⁵⁰⁷ GOOG-DOJ-AT-01511990, at -995 (August 13, 2020, Google document titled, “George | Rahul 1:1 notes,” Contains notes on various features of Google’s ad products, beginning in June 3rd, 2020).

⁵⁰⁸ GOOG-DOJ-02133757, at -757 (Google Email from Brian Axe starting on July 24, 2008 regarding “afc online vs direct”: “To say it differently, because we control the ad server, we can more efficiently enter our ads into the auction and will win more auctions and provide more revenue to big pubs . . .”) (ellipsis in original).

- AdX was given “the direct line of inventory provided by DFP via dynamic allocation.”⁵⁰⁹
- DA resulted in DFP “almost always call[ing] Ad Exchange [AdX].”⁵¹⁰
- “The problem for publishers with [EDA] of course is that Google only allows it’s [sic] owned and operated ad exchange to win those impression opportunities.”⁵¹¹

336. Google did not grant DA to third-party exchanges because it would “[destroy] this competitive first look advantage and would most likely lead to AdX (1) losing access to overall queries, and (2) losing access to *highest-value* queries.”⁵¹² Google also recognized that there could be negative effects to AdX if rival exchanges bid first.⁵¹³

337. Third-party ad exchanges also recognized that the first-look advantage granted to AdX by Dynamic Allocation impaired their ability to compete with AdX:

- A 2019 presentation from OpenX noted that before header bidding, AdX was able to bid “in real time on every impression vs static prices from third party

⁵⁰⁹ GOOG-DOJ-04830048, at -048 (Google Email starting on August 31, 2017 regarding a DoubleClick Spinoff and the impact of launching AdX on non-DFP servers).

⁵¹⁰ GOOG-DOJ-AT-02199478, at -504 (June 2019, Google slide deck titled, “Ad Manager Ecosystem 101”).

⁵¹¹ GOOG-TEX-00089490, at -496 (January 2016, Google document titled, “Yield management overview”).

⁵¹² GOOG-DOJ-04830048, at -048 (Google Email starting on August 31, 2017 regarding a DoubleClick Spinoff and the impact of launching AdX on non-DFP servers) (emphasis in original).

⁵¹³ GOOG-DOJ-14510226, at -230 and -236, (2015, Google document, titled “Mediated Signal Measurement”, discussing mediation, when referring to other demand sources obtaining a first look before AdX: “We need to show cherry picking concept[.] The reason AdX is filling at lower rates is because it is getting the worst impressions ... We hope buyers will pay more if they see they are getting first look. Every signal gets degraded from buyer’s perspective...”); and GOOG-DOJ-13205878, at -878 (August 2016, Google document titled, “Ramping Up Mediation Detection Signals”: “Our competitors are cherry picking higher value impressions at a low fill rate (<20%) and then passing the leftovers to be filled by Google. This tactic is leading them to appear as being a high performing partner and Google increasingly being a long tail network with lower CPMs.”).

exchanges.”⁵¹⁴

- Michael Shaughnessy of Kargo, an ad exchange, testified to the ways Google’s conduct “make[s] it harder for other SSPs to compete against Google.”⁵¹⁵ For example, “dynamic allocation, and enhanced dynamic allocation ... prior to header bidding, there wasn’t a dynamic opportunity for different vendors to compete within the ad stack.”⁵¹⁶ Likewise, “things like First Look ... give[s] AdX the opportunity to compete with sponsorship line items, which traditionally other SSPs have not been able to do, even with the inclusion of header bidding.”⁵¹⁷

338. Around the time DA was launched, Google estimated DFP had a 60% share of the Publisher Ad Server market.⁵¹⁸ Advertisers wishing to reach this substantial DFP inventory and, particularly, the high-valued portion of that DFP inventory, were effectively compelled to submit their bids via AdX. Other ad exchanges were effectively precluded from transacting this inventory unless the buyers on AdX decided not to purchase it. Consequently, ad exchanges other than AdX were excluded from competing at any price for premium impressions offered by DFP. Moreover, because AdX was able to “cream skim” impressions, the average historical price of other ad exchanges that commonly determine their positions in ad server waterfalls, like DFP’s waterfall, fell, further shrinking the pool of impressions over which other ad exchanges were able to compete. This reduced transactions on other exchanges, denying rival

⁵¹⁴ OPENX-00001611, at -620 (May 10, 2019, OpenX document titled, “Charter – OpenX”).

⁵¹⁵ Deposition of Michael Shaughnessy (Kargo), August 9, 2023, 51:18–51:21.

⁵¹⁶ Deposition of Michael Shaughnessy (Kargo), August 9, 2023, 51:23–52:7.

⁵¹⁷ Deposition of Michael Shaughnessy (Kargo), August 9, 2023, 52:24 – 53:4. *See also* Deposition of Michael Shaughnessy (Kargo), August 9, 2023, 71:21 – 73:3.

⁵¹⁸ *See* GOOG-DOJ-01657697, at -845 (March 15, 2007, Google slide deck titled, “Google/DoubleClick – Strategic Opportunities”); and *see also* GOOG-DOJ-00970889, at -894 (May 19, 2007, Google slide deck titled, “Project Liberty Revisited – EMG Deal Review”).

exchanges the scale of transactions needed to compete.

C. Google Exploited its Market Power to Protect AdX from Competition

339. Not only did Google engage in the previously described conduct to establish and defend an exclusive pool of supply and demand on AdX (thereby preventing competition from other ad exchanges for these transactions at any price), but Google also engaged in other acts that diminished the price competition AdX faced for other inventory, as well. In fact, Google thwarted exchange competition by using its sell-side and buy-side enterprises to “favor[] AdX when possible.”⁵¹⁹

340. Google did not want AdX placed in simultaneous (or “real-time”) price competition with other ad exchanges and demand sources. Google, therefore, took advantage of its control over DFP inventory to grant AdX the opportunity to submit bids *after* the bids from other buyers were submitted, particularly those competing in header bidding. This “Last Look” represented a substantial advantage for AdX and impaired the ability of rival ad exchanges to compete for this DFP inventory. Google also exploited its market power in the Ad Exchange market to obtain a similar “Last Look” from third-party publishers wishing to access AdX demand.

341. When confronted with a yield manager, AdMeld, that enabled real-time price competition, Google responded by purchasing AdMeld and deprecating its key features.

⁵¹⁹ GOOG-DOJ-13127211, at -214 (Undated, Google document discussing DRX and Header Bidding).

high-value advertising partners. Publishers' fulfillment of those commitments requires serving impressions to the advertising partners even if the publishers sacrifice "a little short term [sic] revenue."⁶¹⁴ In fact, publishers employ "*teams* of humans devoted to this task" of ensuring they fulfill partner commitments.⁶¹⁵

393. Google's Mr. Levitte explained to his colleagues that removing the flexibility of publishers to set specific floors would be "a poor strategy" because "this is the same ask we've heard loudly again and again from almost every major pub."⁶¹⁶

2. Google Deprecated the Ability to Set Different Floors

394. Google was aware that publishers often set higher floor prices for AdX than for other exchanges or ad buyers.⁶¹⁷ This had two effects. *First*, it allowed publishers to make AdX "work harder" to secure impressions, i.e., by increasing the bids AdX submitted to

⁶¹⁴ GOOG-DOJ-14152425, at -427 (July 7, 2016, Google Email and chat chain regarding "Deals/Indirect/Jedi DRX Vision – June 29th Meeting": "One common example I've heard is that the pub has a very high \$\$\$\$ relationship with some large partner (e.g. big agency) and has promised the partner some volume of inventory via PMP. If the deal is tracking behind then the pub may decide to increase the prioritization of that partner in their stack to artificially increase the volume of impressions won by that partner. So on an individual auction the pub might likely be accepting less \$ than they could get elsewhere, but because the overall relationship with the partner is worth \$\$\$\$ it's wise to sacrifice a little short term revenue so the pub can make sure they're good on . . . whatever commitments they've made to that partner").

⁶¹⁵ GOOG-DOJ-14152425, at -427 (July 7, 2016, Google Email and chat chain regarding "Deals/Indirect/Jedi DRX Vision – June 29th Meeting").

⁶¹⁶ GOOG-DOJ-14152425, at -427 (July 7, 2016, Google Email and chat chain regarding "Deals/Indirect/Jedi DRX Vision – June 29th Meeting").

⁶¹⁷ GOOG-TEX-00124787, at -788 and -792 (July 9, 2018, Google slide deck titled "DRX Unified Yield Management Strategy Review": "Pubs continue to multi-list inventory . . . with higher floors on AdX . . . 42% of HB queries have a higher AdX floor than the HB LI price"); GOOG-DOJ-09429821, at -821 (March 16, 2018, Google email from Nirmal Jayaram: "Publishers tend to have higher floors of AdX, which is why DBM ends up winning on other exchanges"); GOOG-TEX-00122345, at -348 (July 20, 2017, Google email from Jim Giles: "We suspected higher AdX floors is what was happening . . . Now that we know for sure, there are several things we can do about it."); and GOOG-DOJ-10924270, at -273 (January 10, 2019, Google slide deck titled, "Changes to Ad Manager auction." ". . . pubs typically higher floors on AdX [sic] compared to other SSPs, sometimes resulting in price-based incrementality of inventory on other SSPs").

publishers.⁶¹⁸ Google understood that publishers may be exploiting Google's bidding algorithms and extracting buyer surplus from Google's second-price auction.⁶¹⁹ By setting a higher floor price for AdX, publishers could generate more revenue through Google's second-price auction by inducing Google to lower its take rate or otherwise raise the AdX net bid, or by simply having the floor become the second price in the auction.

395. *Second*, to the extent Google couldn't beat the floor price, a higher floor price on AdX would have the effect of directing inventory to other exchanges. This would be consistent with publishers' interests in developing "long term" relationships with different demand sources.

396. Google viewed this publisher behavior as a threat.⁶²⁰ Google considered overriding the AdX floors to allow AdX to compete for impressions even when publishers intended to direct impressions *away* from AdX.⁶²¹ Google entertained the idea of "picking a war on this one," namely publishers use of distinct floors for different exchanges or ad buying tools, even though it was "legitimate" for publishers to do so.⁶²²

⁶¹⁸ GOOG-TEX-00122345, at -346 (July 21, 2017, Google email from Jonathan Bellack: "Max raises an interesting point that some pubs are raising AdX floors on purpose to make us work harder.").

⁶¹⁹ GOOG-TEX-00122345, at -346 (July 21, 2017, Google email from Jonathan Bellack).

⁶²⁰ GOOG-DOJ-09429821, at -821 (March 16, 2018, Google email correspondence including executive Nirmal Jayaram, Google indicates its ad tech products are "broken" because publishers are transacting impressions off AdX by setting higher floors on AdX. Google considered ways to stop the intermediation of Google publisher sales to Google buyers off AdX, including stopping buying in third-party exchanges.).

⁶²¹ GOOG-TEX-00122345, at -349 (July 20, 2017, Google internal email from Jim Giles: "[I]f any bid from an exchange is lower than the AdX floor, then we would ignore the AdX floor and let AdX compete . . . this at least protect[s] us from those exchanges . . .").

⁶²² GOOG-TEX-00122345, at -345 (July 21, 2017, Google email from Eisar Lipkovitz).

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397. Google had considered eliminating buyer-specific floors in 2018 in order to “address uneven inventory access due to differential pricing floors between external exchanges and AdX.”⁶²³ Finally, in 2019, Google removed from DFP the capacity for publishers to set distinct floors. Google “removed the ability to set floors per buyer to make it more difficult for the publisher to disadvantage us.”⁶²⁴ One Google executive observed that the “presence of per demand floors really hurts us and has been one of the biggest challenges for AdX as a platform vs some of the other exchanges.”⁶²⁵

398. In place of flexible, buyer-specific floors, Google implemented so-called Unified Pricing Rules (UPR) that required publishers to set a common floor price for all exchanges and ad buyers.⁶²⁶ The move was intended to “improve Google net revenue by mitigating the impact of inventory multi-listing.”⁶²⁷

399. A January 2019 Google slide deck seeking to broadly launch UPR (and the other auction changes jointly termed Unified First Price Auction) identified as the rationale for the auction changes only “improv[ing] AdX competitiveness” by “reduc[ing]

⁶²³ GOOG-TEX-00096393, at -393 (June 21, 2018, Google email correspondence).

⁶²⁴ GOOG-DOJ-AT-01511990, at -992 (August 6, 2020, Google document titled “George: Rahul 1:1 Notes”).

⁶²⁵ GOOG-DOJ-02857290, at -290 (May 11, 2019, Internal Google email from Sagnik Nandy with subject “Re: First-price & Removing pricing knobs”).

⁶²⁶ Bigler, Jason, “An update on first price auctions for Google Ad Manager,” Google Ad Manager Blog, May 10, 2019, available at <https://www.blog.google/products/admanager/update-first-price-auctions-google-ad-manager/>, last accessed December 7, 2023; *See also* Bigler, Jason, “Rolling out first price auctions to Google Ad Manager partners,” Google Ad Manager Blog, September 5, 2019, available at <https://www.blog.google/products/admanager/rolling-out-first-price-auctions-google-ad-manager-partners/>, last accessed December 7, 2023; and *see also* GOOG-DOJ-AT-01139367, at -367 (February 13, 2019, Google document: “. . . allowing publishers to set a single floor across all their demand sources”).

⁶²⁷ GOOG-TEX-00124787, at -788 (July 9, 2018, Google slide deck titled, “DRX Unified Yield Management Strategy Review”).

prevalence of price-based incremental inventory on 3P SSPs.”⁶²⁸

400. Fearing that publishers would object to the restriction on their floor price setting, Google paired its imposition of UPR with its migration from a second-price auction to the Unified First Price Auction (UFPA). With the move to a first-price auction, floor prices were not expected to directly affect the auction clearing price.⁶²⁹ Hence a rationale for differential flooring, e.g., across first-price and second-price exchange auctions, was eliminated with Google’s move to UFPA. Other exchanges had already adopted first-price auctions.⁶³⁰

401. But record evidence suggests Google had another reason for bundling UPR with the transition to a first-price auction. In particular, Google transitioned to a first-price auction and “bundled it with a bunch of contentious changes (to make the contentious ones more stomachable [sic] since on a net it’s still a benefit. So we overhauled pricing rules when we moved to first price auction.”⁶³¹

402. A January 2019 Google slide deck soliciting approval to proceed with the launch of UFPA stated explicitly that Google’s “1P migration will be leveraged to unwind AdX

⁶²⁸ GOOG-DOJ-10924270, at -271 (January 10, 2019, Google slide deck titled, “Changes to Ad Manager auction”).

⁶²⁹ GOOG-DOJ-10664165, at -165 (May 11, 2019, Internal Google email correspondence from Rahul Srinivasan).

⁶³⁰ See GOOG-AT-MDL-001283581, at -581, -586, and -596 (May 30, 2017, Google document titled “Exchange Auction Format Analysis”: “[S]ome exchanges appear to simply run first-price ... auctions” ... “AppNexus appears to aggressively use first pricing” ... “OpenX seems to use multiple levels of price floors. The results are somewhat skewed towards first-price, but no soft floors or consistent first-pricing are visible.”).

⁶³¹ GOOG-DOJ-AT-01511990, at -992 (August 6, 2020, Google document titled “George: Rahul 1:1 Notes”).

advertisers, provided Google Ads wins some of the recaptured impressions.

F. Google's Exclusionary Conduct Harmed Competition in the Relevant Antitrust Markets

i. Google's Exclusionary Conduct Diverted Transactions from Google's Rivals and Impaired Their Ability to Develop Scale

431. Google's conduct discussed above contributed to harming the competitiveness of Google's rivals in the Publisher Ad Server, Ad Exchange, and Advertiser Ad Network markets by capturing impressions that would have otherwise been won by Google's rivals and by impairing the ability of rivals to compete. In this section, I explain how this exclusion further harmed competition by depriving rivals of scale; weakening the third-party ecosystem of the ad tech stack, and ultimately induced exit and discouraged entry.

432. As I explain in Section VI.E, scale is important to many ad tech products because of scale economies, indirect network effects, and informational advantages associated with scale. Google's challenged conduct diverted impressions from its rivals, limiting their scale. The need for scale to compete imposes a barrier to entry.

1. Google's Exclusionary Conduct Denied Scale to Rivals in the Ad Exchange Market

433. As discussed above, Google engaged in exclusive conduct which impaired, and continues to impair, competition in the Ad Exchange market. By excluding rival exchanges from transacting impressions, Google's conduct denies them the scale

necessary to effectively compete in the Ad Exchange market. Specifically:

- By restricting Google Ads’ demand exclusively to AdX, Google foreclosed rival ad exchanges from competing for that demand at any price;
- By granting AdX an exclusive First Look at DFP inventory, Google foreclosed rival ad exchanges from competing for that inventory at any price;
- By granting AdX a Last Look at DFP inventory offered through header bidding auctions as well as third-party inventory, Google secured AdX the opportunity to win transactions away from rival exchanges, impairing their ability to compete on price;
- By deprecating AdMeld’s functionalities related to real-time bidding, Google helped protect AdX’s privileged First and Last Look positions, impairing the ability of rival ad exchanges to compete on price; and
- By removing the ability of DFP publishers to set high floor prices for AdX, Google protected AdX from this source of price competition.

434. Executives of ad exchanges explained the importance of scale in the Ad Exchange market. For instance, [REDACTED], testified

that “[t]he more scale of transactions that you’re privy to, the more accurately you can determine a predicted win rate at every price point with those predictions being highly reliable.” [REDACTED] firm did not have the scale “to employ this technology.”⁶⁸⁹

[REDACTED] testified that AdX’s scale gives it “more access to data from a larger footprint of publishers, the larger footprint of demand makes them more – it

⁶⁸⁹ Deposition of [REDACTED]

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allows them to drive more spend into publishers and going back to the – the connection with the ad server is critical and the fact that it’s a tremendous amount of data that we don’t have.”⁶⁹⁰

435. [REDACTED] testified about the importance of scale in the Ad Exchange market: “[t]he bigger you are...the more data flows through your system and the better you can optimize your algorithms...the larger the deal size is that you can bring onto your platform through the buy side...the more your ability is to...grow your business on top of what’s already a fixed cost basis and become more profitable.”⁶⁹¹ [REDACTED] testified that it is difficult for [REDACTED] to compete with Google given the differences in market share. The firm does not consider AdX a director competitor, and typically tries to compete with [REDACTED]
[REDACTED]⁶⁹²

436. Google’s conduct “prevents competing SSPs from achieving a critical size to lower prices and innovate,” according to testimony by [REDACTED] a rival PAS and ad exchange.⁶⁹³ Absent Google’s exclusion, “[REDACTED] could have reached the scale so as to maintain and increase its investments...in order to offer its clients a viable alternative to Google to its ad server and also to the SSP.”⁶⁹⁴ However, [REDACTED] “[REDACTED] and the other SSPs are not competing on a level playing field with Google’s

⁶⁹⁰ Deposition of [REDACTED]

⁶⁹¹ Deposition of [REDACTED]

⁶⁹² Deposition of [REDACTED]

⁶⁹³ Deposition of [REDACTED]

⁶⁹⁴ Deposition of [REDACTED]

publishers and advertisers will bear some of the losses imposed by supra-competitive AdX fees.⁷³⁹ Moreover, as standard tax incidence theory holds, the magnitude of the surplus loss is increasing in the square of the take rate.⁷⁴⁰ This means the incremental loss in surplus is increasing in the magnitude of the take rate.

E. Google's Exclusionary Conduct Impairs Match Quality in Open Web Display Advertising

476. Google's challenged conduct diminishes social surplus by distorting the allocation of impressions to advertisers. As explain above in Section VI.B.v, under general conditions, social surplus is maximized when the advertiser with the highest willingness to pay for an impression is the advertiser who wins the impression. Any distortion which prevents that advertiser from winning in favor of another advertiser with a lower willingness to pay reduces social surplus. One of the benefits of open web display advertising is the capacity for advertisers to narrowly target their campaigns to their specific marketing demands. But Google's challenged conduct impedes this targeting, lessening surplus in the market. Google caused such distortions in at least

⁷³⁹ Simcoe Report Sections V.B.1 and V.B.2. Even if advertising supply is fairly inelastic in the short run, it is unlikely to be perfectly inelastic because publishers can adjust the number of impressions they make available for mediation, i.e., by increasing direct deals and adjusting floor prices passed to indirect sales, as well as changing the number of ad slots per webpage. In the long run, publishers can adjust their inventory of impressions by adjusting their supply of content that generates impressions. Some publishers could potentially switch to a different monetization strategy entirely. Hence, long run supply is not perfectly inelastic. Consequently, advertisers will bear some of the burden of the supra-competitive AdX take rate.

⁷⁴⁰ Mankiw, N. Gregory, *Principles of Economics*, Cengage Learning 8, (2016), at p. 161, ("Indeed, the deadweight loss of a tax rises even more rapidly than the size of the tax. This occurs because the deadweight loss is the area of a triangle, and the area of a triangle depends on the *square* of its size. If we double the size of a tax, for instance, the base and height of the triangle double, so the deadweight loss rises by a factor of 4. If we triple the size of a tax, the base and height triple, so the deadweight loss rises by a factor of 9.) (emphasis in original).

five ways.

477. *First*, because Google's fees are not constrained by competition with other exchanges, an AdX advertiser (whether Google Ads, DV360 or a third-party advertiser) may have a greater willingness to pay for an impression, but, nevertheless, lose the impression to another advertiser who transacts through a lower cost channel;

478. *Second*, Google Ads' exclusive buying on AdX precludes advertisers from acquiring impressions offered only on other exchanges. Such impressions likely would have provided greater surplus to Google Ads' advertisers on at least some occasions. In fact, evidence presented in Section VIII.B demonstrates that Google was aware that its foreclosure of Google Ads' buying on other exchanges forestalled transactions its advertisers wished to undertake. This was particularly true for high-value remarketing impressions that critically depend upon matches between advertisers and the specific online audience that has visited the advertisers' websites;

479. *Third*, Google's exclusive restriction of DA's First Look and Last Look features to AdX enables AdX to preferentially access inventory irrespective of whether AdX supplied the best match, i.e., the buyer with the highest willingness to pay. Google admits, "[l]ast look ... affects who wins the impression."⁷⁴¹ In particular, an advertiser buying via a third-party exchange with the high willingness to pay for an impression may lose

⁷⁴¹ GOOG-DOJ-07801426, at -430 (Internal Google email (starting on February 27, 2019) regarding first-price auction and Last Look concerns). *See also* GOOG-TEX-00104315, at -315 (September 2016 Google email chain, "We managed historically to have an advantage through EDA vs other sources of demand ... so our demand could win even if we did not provide the best CPM on a specific impression." (Ellipsis in original)).

the impression to an advertiser using AdX because of the AdX advantage in DFP. As I described in Section VIII.B.ii.2, economic theory predicts the magnitude of the distortion caused by this preferential access grew because the preference was reinforcing. Furthermore, this is exacerbated by Google's bid manipulation schemes. Google's programs such as Bernanke and DRS are designed precisely to allow AdX advertisers with lower willingness to pay to sometimes win impressions over non-AdX advertisers with greater willingness to pay. This sacrifices advertiser surplus to Google's effort to capture transactions from its competitors;

480. *Fourth*, AdMeld provided a platform whereby buyers across exchanges could compete for impressions, increasing the likelihood—if not guaranteeing—that the bidder who most highly valued particular impressions would win them. Google eliminated this AdMeld feature following its acquisition, diminishing the likelihood that impressions would be allocated to their highest value uses; and

481. *Fifth*, UPR restricted publishers from directing their inventory to their preferred demand sources. Evidence considered in Section VIII.C.iii indicates publishers preferred to direct inventory away from AdX. UPR impeded them from doing so, lessening publisher surplus. In addition, in combination with the 5% surcharge DFP charged to non-AdX participants in Open Bidding, UPR may not always lead to the advertiser with the highest willingness to pay winning an impression.

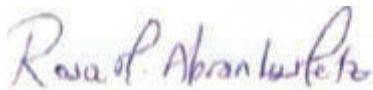
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multitude of dimensions, including price and quality. For instance, consumers may shop various stores to find the best price for a specific product from among several sellers. Economists refer to this activity as *consumer search*, and it may also encompass visits to retailer websites, as well as websites of third parties providing product information, like Consumer Reports.

501. Advertising tends to lower consumer search costs by “inform[ing] customers about brands’ characteristics, and improv[ing] the matching of consumers and products.”⁷⁵⁸ Google’s exclusionary conduct decreases the quantity and quality of open web display transactions and would thus reasonably be expected to impair this advertising from functioning in a way that lowers consumer search costs.

502. I reserve the right to update my opinions if and when more information becomes available.

Respectfully submitted,



Rosa M. Abrantes-Metz, PhD

December 22, 2023

⁷⁵⁸ Grossman, Gene M. and Carl Shapiro, “Informative Advertising with Differentiated Products,” *The Review of Economics Studies* 51, no. 1 (1984): 63-81, at p. 77.

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Errata

Page	Paragraph	Original	Corrected
16	29	... appears to the right of the webpage at allrecipies.com.	... appears to the right of the webpage allrecipies.com.
33	65	Google operates an exchange called AdX.	Google operates an ad exchange called AdX.
33	65	Other exchanges include Xandr and OpenX.	Other ad exchanges include Xandr and OpenX.
37	72	... that serves more than "thousands of publishers around the globe."	... that serves "thousands of publishers around the globe."
49	95	Google Ads must pay for each advertisement it purchases from a publisher on AdX, ...	Google Ads must pay for each impression it purchases from a publisher on AdX, ...
55	106	...the inventory of multiple combined ad networksthe inventory of multiple ad networks ...
65	124	I describe the mechanics of these auctions in greater detail in Section VI.C. I describe the mechanics of these auctions in greater detail in Section VI.C.	I describe the mechanics of these auctions in greater detail in Section VI.C.
116	215	Focusing on the ad stack , ...	Focusing on the ad tech stack , ...
127	233	...“there are scale advantages to the ad tech network business that will provide higher operating margins to combined ad networks with the biggest scale, so as the technology advantages diminish over time, we believe we will be in a position to take advantage of the scale benefits.”	...“there are scale advantages to the ad network business that will provide higher operating margins to ad networks with the biggest scale, so as the technology advantages diminish over time, we believe we will be in a position to take advantage of the scale benefits.”
138	260	...transactions as need to raise the net-bids to publisherstransactions as need to raise the net bids to publishers ...
138	260	Google also increased margins on less-competitive impressions...	Google also increased margins on less competitive impressions...
138	260	These bid manipulation schemes secured impressions for Google buyers that they...	These bid manipulation schemes secured impressions for AdX that it...
139	262	The floor price may be the highest price associated with another exchange in the waterfall ...	The floor price may be the highest price associated with another demand source in the waterfall ...
145	275	Google wins the impression at a <i>cost</i> to Google of \$0.10.	Google Ads wins the impression at a <i>cost</i> to Google Ads of \$0.10.
146	276	The winning advertiser pays Google Ads \$0.83 , ...	The winning advertiser pays Google Ads \$0.96 , ...
152	286	then "It'll transfrom the system ...	Then "[i]t'll transfrom the system ...

Page	Paragraph	Original	Corrected
154	291	"esp. given current health growth levels, ...	"esp. given current healthy growth levels, ...
165	313	Exclusive access to Google (Ads') demand ...	Exclusive access to Google Ads' demand ...
168	314	Our by-side positioning...	Our buy-side positioning...
174	327	Given the lower value for which they competed, ...	Given the lower value impressions for which they competed, ...
203	388	... the reduction of publishers' dependance on AdX.	... the reduction of publishers' dependence on AdX.
212	405	DFP imposed the 5% surcharge on third- party exchanges competing in AdX's real-time auction.	DFP imposed the 5% surcharge on the publisher when third-party exchanges competing in Open Bidding won the publisher's impression.
212	405	... would have been lower than the net- bids of AdX...	... would have been lower than the net bids of AdX...
216	413	Instead, as Kevel's James Avery explained...	As Kevel's James Avery explained...
219	419	... explains that deprecating AdX "aligns explains that deprecating AdX Direct "aligns ...
227	435	... compete with Pubmatic, Index Exchange, OpenX, Xandr.	... compete with Pubmatic, Index Exchange, OpenX, and Xandr.
228	438	... related to real-time bidding, and Google helped protect DFP...	... related to real-time bidding, Google helped protect DFP...
230	442	... allows publisher ad servers to develop and train its RPO algorithms:	... allows publisher ad servers to develop and train RPO algorithms:
231	444	Finally, Google engaged in exclusive conduct with impaired,	Finally, Google engaged in exclusive conduct which impaired,
236	460	... granted AdX a First Look of DFP inventory...	... granted AdX a First Look at DFP inventory...
237	460	.. granted AdX a Last Look of DFP inventory..	.. granted AdX a Last Look at DFP inventory..
242	469	To compare the magnitude of the variation of of AdX's take rate...	To compare the magnitude of the variation of AdX's take rate...
246	475	Instead, as explained in Section Error! Unknown switch argument., ...	Instead, as explained in Section IV.C.iii ...
254	493	... "would increase our ability to create content, produce products, development new commercial products."	... "would increase our ability to create content, produce products, development [sic] new commercial products."
254	493	Gannett's output of advertising impressions. ⁷⁵³	Gannett's output of advertising impressions. ⁷⁵³
256	499	... Alphabet CEO Sundar Pichai's testified Alphabet CEO Sundar Pichai testified ...

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